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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/586,911	07/24/2006	Koen Verhaert	VERH3007/JEK	3167
23364	7590	08/19/2009	EXAMINER	
BACON & THOMAS, PLLC 625 SLATERS LANE FOURTH FLOOR ALEXANDRIA, VA 22314-1176			WEST, JEFFREY R	
		ART UNIT	PAPER NUMBER	
		2857		
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		08/19/2009		PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/586,911	VERHAERT, KOEN	
	<b>Examiner</b>	<b>Art Unit</b>	
	Jeffrey R. West	2857	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 24 July 2006.  
 2a) This action is **FINAL**.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 15-28 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 15-28 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 24 July 2006 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____ .
3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>07/24/06</u> .	5) <input type="checkbox"/> Notice of Informal Patent Application
	6) <input type="checkbox"/> Other: _____ .

## DETAILED ACTION

### *Drawings*

1. The drawings in Figures 1, 2, 4, and 5 are objected to because they do not have sufficiently descriptive labels, specifically, blank boxes in drawings should be labeled descriptively unless it is a well-known component.
2. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Specification***

3. The abstract of the disclosure is objected to because of the following informalities:

Lines 6-7 recite, "the above mentioned means are connected, with arithmetic unit comprises a first algorithm". Reference to such "means" should be removed and "with arithmetic unit comprises" should be changed to ---with the arithmetic unit comprising---.

Applicant is reminded of the proper language and format for an abstract of the disclosure:

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Correction is required. See MPEP § 608.01(b).

***Claim Objections***

4. Claims 15, 16, and 24 are objected to because of the following informalities:

In claim 15, line 1, to avoid problems of antecedent basis, “the road” should be --- a road---.

In claim 15, line 4, to avoid problems of antecedent basis, “the absolute” should be ---an absolute---.

In claim 15, lines 5-6, to avoid problems of antecedent basis, “the instant” should be ---an instant---.

In claim 15, line 10, to avoid problems of antecedent basis, “three sensors” should be ---three inertia sensors---.

In claim 15, line 11, to avoid problems of antecedent basis, “at least the step distance” should be ---at least a step distance---.

In claim 15, lines 11-12, to avoid problems of antecedent basis, “the cumulative step distance” should be ---a cumulative step distance---.

In claim 16, lines 1-2, to avoid problems of antecedent basis, “the algorithm enables the determination of the direction” should be ---the first algorithm enables a determination of a direction---.

In claim 24, line 2, to avoid problems of antecedent basis, “for the drift of the gyroscopes” should be ---for drift of the at least two gyroscopes---.

In claim 24, line 3, to avoid problems of antecedent basis, “the gyroscopes” should be ---the at least two gyroscopes---.

Appropriate correction is required.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 22-25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 22 is rejected under 35 U.S.C. 112, second paragraph, because it attempts to further limit parent claim 15 “wherein the inertia sensors include at least two gyroscopes which are oriented according to mutual directions, at least one magnetometer and at least one accelerometer.” This limitation is considered to be vague and indefinite because it is unclear to one having ordinary skill in the art the manner in which specifying “at least two gyroscopes which are oriented according to mutual directions, at least one magnetometer and at least one accelerometer” is to further limit “the inertia sensors”, specifically, 1) whether each inertia sensor is to include the at least two gyroscopes, at least one magnetometer, and at least one accelerometer, 2) whether each inertia sensor is to either include at least two gyroscopes, or at least one magnetometer, or at least one accelerometer, or 3) whether claim 22 is attempting to further limit the group of “at least three inertia sensors” of parent claim 15 to now be a group of at least four inertia sensors, the group of at least four inertia sensors including at least two gyroscopes, at least one magnetometer, and at least one accelerometer.

Claim 25 is considered to be vague and indefinite because it refers to “the signals of the accelerometers” while there is no previous mention of any

“accelerometers” and, as such, it is unclear to one having ordinary skill in the art as to what “the signals of the accelerometers” refers.

Claim 25 is further considered to be vague and indefinite because it attempts to further limit parent claim 15 by specifying that “the means which make it possible to determine the instant at which the person takes a step comprises a second algorithm in the arithmetic unit”. Parent claim 15, however, specifies that the means which make it possible to determine the instant at which the person takes a step is connected to the arithmetic unit and, as such, it is unclear how claim 25 can further limit the means connected to the arithmetic unit to now comprise an algorithm included in the arithmetic unit.

Claims 23 and 24 are rejected under 35 U.S.C. 112, second paragraph, because it incorporates the lack of clarity of parent claim 22.

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 15-23 and 25-28, as may best be understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,305,221 to Hutchings in view of U.S. Patent Application Publication No. 2004/0116836 to Kawai et al.

With respect to claim 15, Hutchings discloses a device to determine the road followed by a person on foot, comprising at least three inertia sensors attached to the body of a person (column 7, lines 58-62, column 8, lines 6-19, and column 9, lines 50-52), and wherein said sensors are arranged to measure the absolute orientation of the part of the body to which they are attached (column 8, lines 20-55); means which make it possible to determine the instant at which the person takes a step (column 7, lines 63-67, column 9, lines 7-16, and column 13, lines 54-65); an arithmetic unit to which the sensors and the means which make it possible to determine the instant at which the person takes a step are connected (column 23, lines 33-55), said arithmetic unit comprising a first algorithm which enables, on the basis of a number of body dimensions of the person concerned and on the basis of the signals coming from the at least three sensors (column 23, lines 33-64), a determination to be made of at least the step distance for every step taken by the person as well as the cumulative step distance from a defined starting point (column 7, lines 63-67, column 8, lines 39-44, column 4, lines 7-16, column 13, lines 54-65, column 18, lines 57-64, and column 24, lines 61-65).

With respect to claim 16, Hutchings further discloses wherein the algorithm enables the determination of the direction of every step, as well as the route followed by the person from the defined starting point (column 7, lines 63-67, column 8, lines 39-44, column 4, lines 7-16, column 13, lines 54-65, column 18, lines 57-64, and column 24, lines 61-65).

With respect to claim 21, Hutchings further discloses including an electric power supply for the sensors and for the arithmetic unit, which power supply is carriable by the person (column 7, lines 23-34 and column 24, lines 4-13).

With respect to claim 25, Hutchings further discloses wherein the means which make it possible to determine the instant at which the person takes a step comprises a second algorithm in the arithmetic unit which makes it possible, on the basis of the signals of the accelerometers of the inertia sensors, to determine when the person is situated with both feet on the ground (column 8, lines 20-31 and column 9, lines 52-62).

With respect to claim 26, Hutchings further discloses including a positioning system which is coupled to the arithmetic unit (column 23, lines 65-64).

With respect to claim 27, Hutchings further discloses including means to establish a wireless connection with a communication network (column 24, lines 4-31).

With respect to claim 28, Hutchings further discloses including a connection enabling communication with a computer (column 7, lines 36-46 and column 24, lines 4-31).

As noted above, the invention of Hutchings teaches many of the features of the claimed invention and while the invention of Hutchings does teach at least three inertial sensors attached to the body of a person at any location (column 8, lines 16-19), Hutchings does not specifically disclose attaching one of said sensors attached to the torso and one of said sensors attached to each leg respectively. Additionally,

while Hutchings does disclose that the inertia sensors include at least two rotation sensors which are oriented according to mutual directions (column 23, lines 35-36), at least one magnetometer (column 23, lines 28-32) and at least one accelerometer (column 23, lines 33-34), Hutchings does not specifically disclose that the rotation sensors are gyroscopes.

Kawai teaches a method and processor for obtaining moments and torques in a biped walking system using a plurality of sensors, one of said sensors attached to the torso (0069, lines 1-5) and one of said sensors attached to each leg respectively (0073, lines 1-10), and wherein said sensors are arranged to measure the absolute orientation of the part of the body to which they are attached (0069, line 1 to 0070, line 12 and 0073, lines 1-10), wherein said sensors include inertia sensors attached to both the upper legs and the lower legs (0073, lines 1-10) using one or several garments which fit tightly onto the torso and onto the legs of the person with said inertia sensors are attached to said garments (i.e. using belts) (0069, lines 1-17 and 0071, lines 1-13). Kawai further teaches that the inertia sensors include gyroscopes and accelerometers integrated in a microprocessor (0019, lines 1-9 and 0069, lines 1-17) and a software filter of the Kalman type using the signals of the gyroscopes with the signals of the accelerometers (0094, lines 1-23).

It would have been obvious to one having ordinary skill in the art to modify the invention of Hutchings to explicitly include attaching one of said sensors attached to the torso and one of said sensors attached to each leg respectively and to explicitly disclose that the rotation sensors are gyroscopes, as taught by Kawai, because, as

suggested by Kawai, the combination would have provided suitable sensors for carrying out the tracking in the invention of Hutchings while providing more accurate measures of movement through implementation of a plurality of sensors located at different locations of a user that better determines corresponding forces acting on the user, thereby providing better measurements of acceleration and determinations of when the user is contacting the ground (0009, line 1 to 0010, line 5, 0014, lines 1-11, 0070, lines 1-12, and 0075, line 1 to 0076, line 7).

9. Claim 24, as may best be understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Hutchings in view of Kawai et al. and further in view of U.S. Patent No. 6,474,159 to Foxlin et al.

As noted above, the invention of Hutchings and Kawai teaches many of the features of the claimed invention and while the combination of Hutchings and Kawai does teach a software filter of the Kalman type using the signals of the gyroscopes with the signals of the accelerometers (Kawai; 0094, lines 1-23), the combination does not explicitly indicate the Kalman filter is for correcting drift.

Foxlin teaches motion-tracking of a user employing gyroscopes and position sensors, wherein a Kalman filter is used for correcting drift of the gyroscopes using the position sensors (column 3, line 66 to column 4, line 9).

It would have been obvious to one having ordinary skill in the art to modify the invention of Hutchings and Kawai to explicitly indicate the Kalman filter is for correcting drift, as taught by Foxlin, because, as suggested by Foxlin, the

combination would have improved the system of Hutchings and Kawai by correcting for drift that would skew the output of the gyroscopes and the resulting user-tracking, thereby improving accuracy of the results (column 3, line 66 to column 4, line 9).

### ***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure:

U.S. Patent Application Publication No. 2002/0143491 to Scherzinger teaches a pedometer navigation system.

U.S. Patent No. 6,013,008 to Fukushima teaches a step count data control system, and its output medium and recording medium.

U.S. Patent No. 4,371,945 to Karr et al. teaches an electronic pedometer.

U.S. Patent Application Publication No. 2002/0040601 to Fyfe et al. teaches a motion analysis system.

U.S. Patent Application Publication No. 2003/0167908 to Nishitani et al. teaches an apparatus and method for detecting performer's motion to interactively control performance of music or the like.

U.S. Patent No. 5,919,149 to Allum teaches a method and apparatus for angular position and velocity based determination of body sway for the diagnosis and rehabilitation of balance and gait disorders.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey R. West whose telephone number is (571)272-2226. The examiner can normally be reached on Monday through Friday, 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eliseo Ramos-Feliciano can be reached on (571)272-7925. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jeffrey R. West/  
Primary Examiner, Art Unit 2857

August 19, 2009